



USDA

Glenn R. Bethel
USDA Remote Sensing Advisor
December 8, 2010

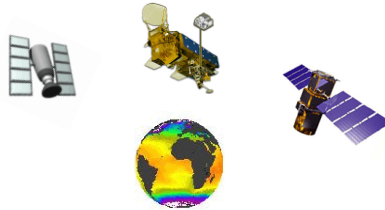


Outline

- Spot
- AWiFS
- Landsat
- MODIS



Satellites



High Altitude Airborne

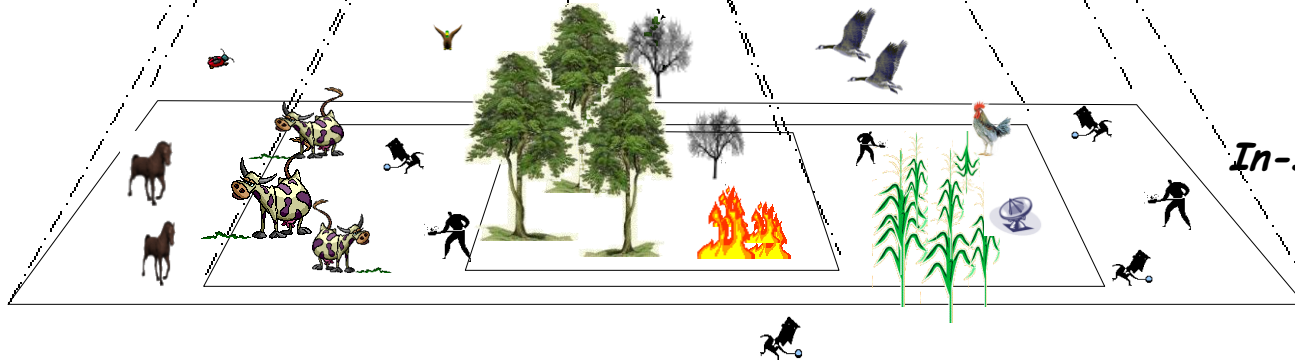


Cross Calibration
Verification and Validation

Low Altitude Airborne



In-situ measurements



Agriculture's Interrelated Policy and Program Considerations

- Commodity programs
- Conservation
- Agricultural trade
- U.S. Nutrition programs
- Rural development
- Agricultural research, education, and extension
- Forestry
- Biofuels
- Sustainable Agriculture
- Disaster programs
- Carbon Markets
- Environment
- Climate change
- Trade Policy
- Access to food by poorest consumers in poorest countries
- Dealing with longer-term scarcity concerns:
 - Land availability
 - Water
 - Food production inputs, especially energy
- Energy (total supply & demand)



10,000+ USDA personnel on the landscape every day, using GPS to provide program assistance, service, and technical support to USDA customers and partners

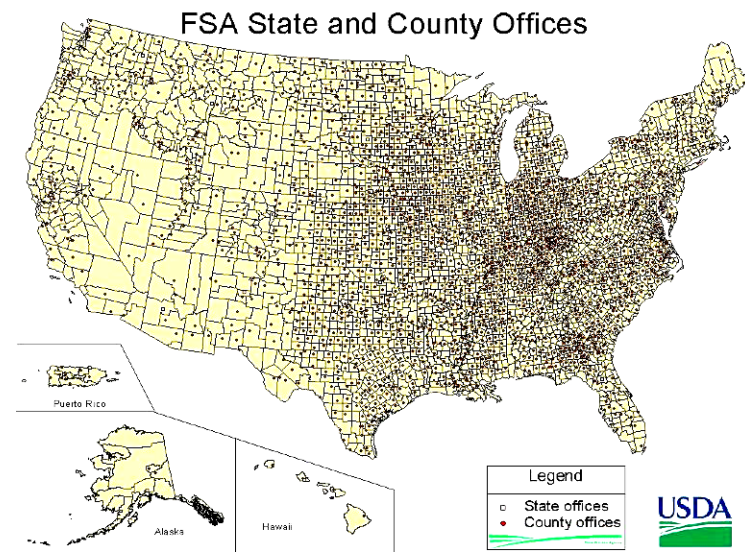
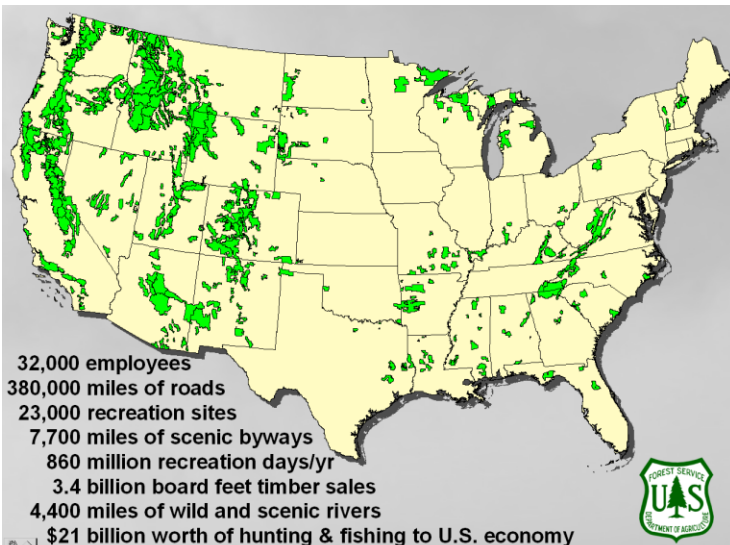
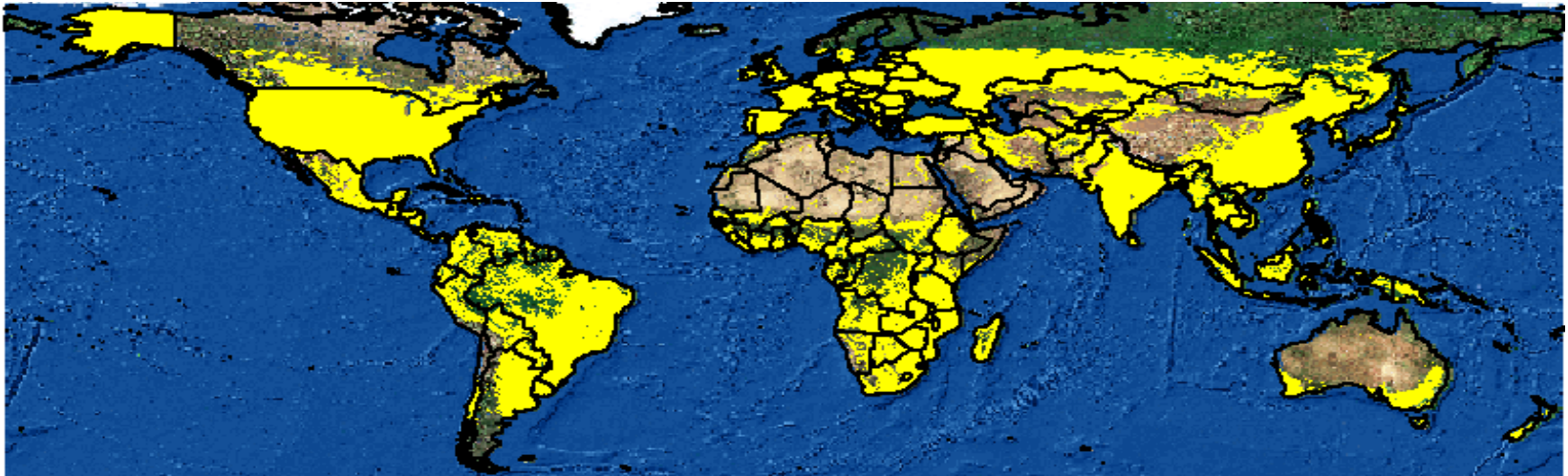
- Safety-of-Life operations –Fire, Snow Survey
 - Administration of the Farm Bill
 - Conservation Planning and Application
 - Natural and Cultural Resource Data Collection, Inventorying and Monitoring
 - Landscape Characterization & Engineering Applications
 - Soil Mapping
- USDA has over 65,000 ESRI desktop licenses

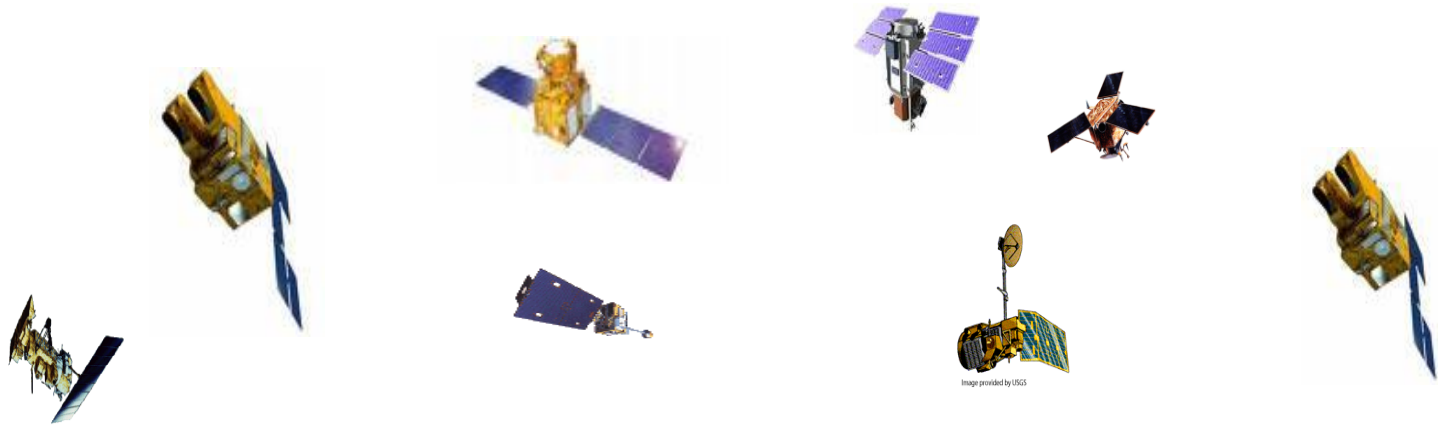


Global to Field Level Requirements



Global Crop Monitoring





Satellite Imagery

AWiFS

MODIS

SPOT



Current US Land Remote Sensing Missions

✓ **AVHRR**

spatial resolution, 1000m

2700 km swath

★ **MODIS**

spatial resolution, 250m, 500m, 1000m

2300 km swath

★ **MISR**

spatial resolution, 275m, 550m, 1100m

360 km swath

global coverage, 9 days

★ **Landsat**

spatial resolution, 15m, 30m

183 km swath

global coverage, seasonal

★ **ASTER**

spatial resolution 15m, 30m, 90m

60 km swath

global coverage, years

✓ **Commercial Systems**

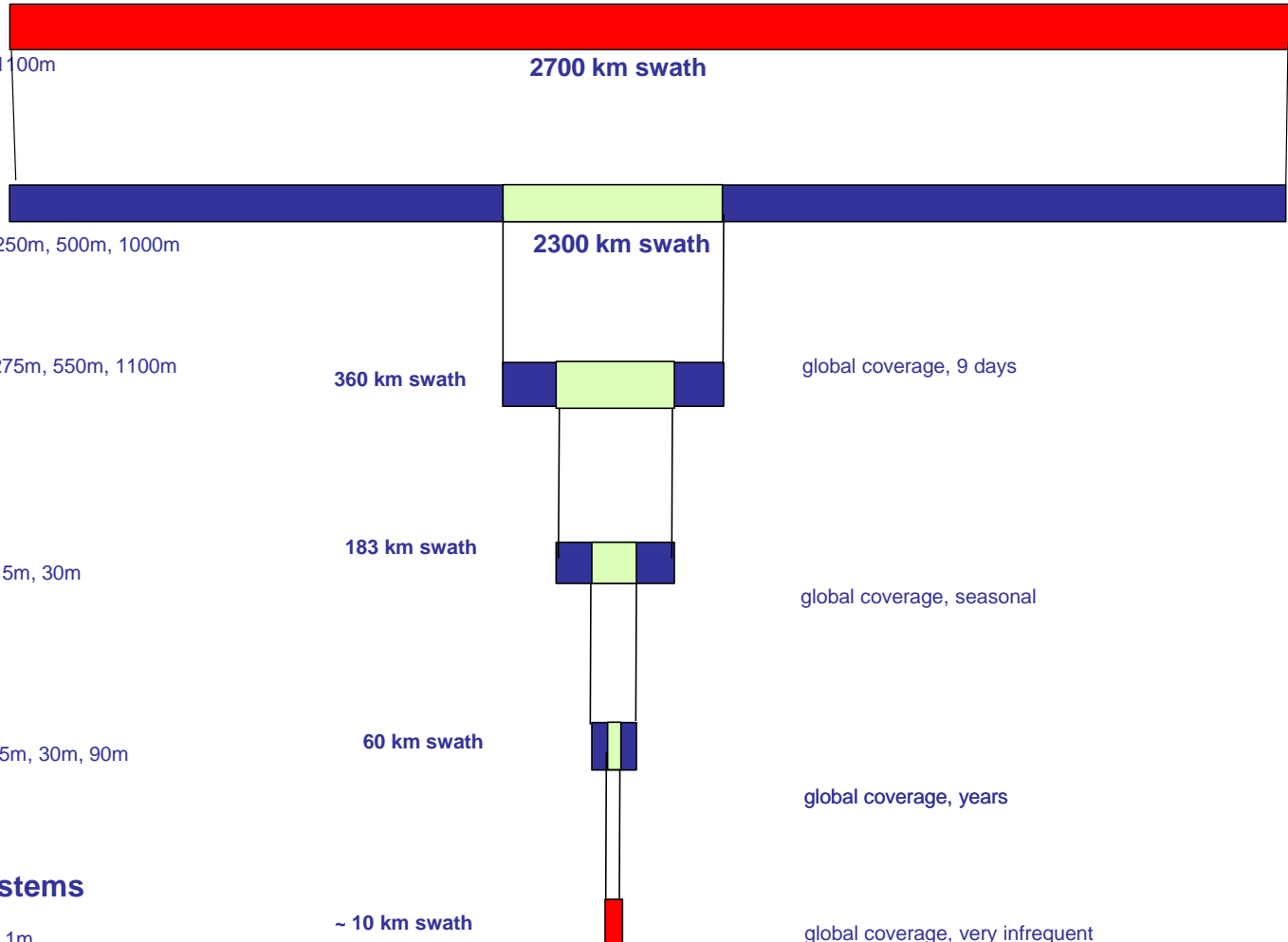
spatial resolution ~ 1m

~ 10 km swath

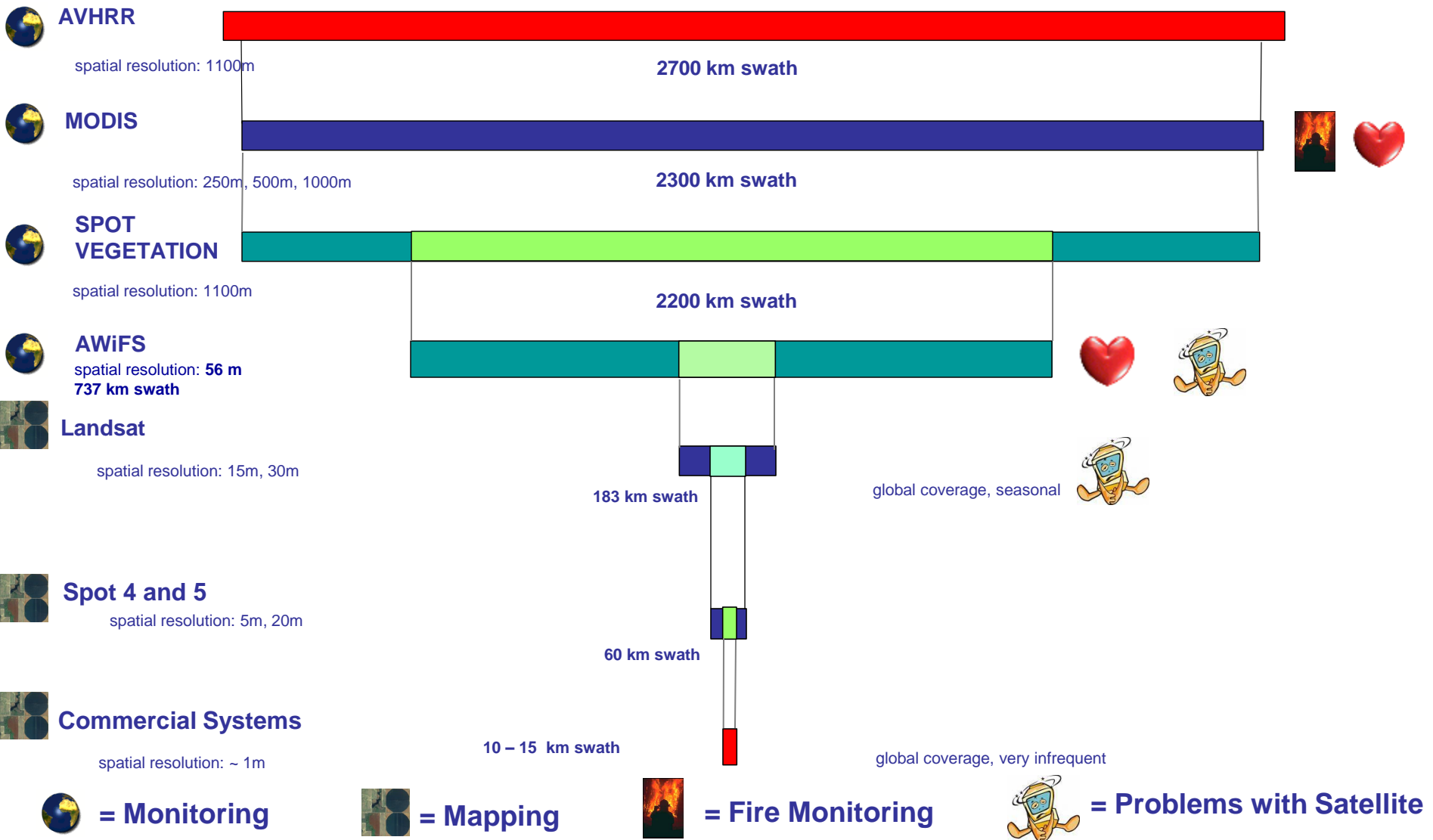
global coverage, very infrequent

★ = Science Missions

✓ = Operational Missions



Current USDA Land Remote Sensing Use



Future US Land Remote Sensing Missions



VIIRS



spatial resolution: 400/800m (nadir(Vis/IR))
3300 km swath

global coverage, 2x/day/satellite



Landsat

spatial resolution, 15m, 30m

183 km swath



global coverage, seasonal



Commercial Systems

spatial resolution ~ 1m

10- 15 km swath



global coverage, very infrequent



= Science Missions



= Operational Missions

Future Operational Monitoring Satellites used by USDA

NPP and VIIRS on PM Acquisitions!



Degraded
Capacity from
MODIS



VIIRS



spatial resolution: 400/800m (nadir(Vis/IR))
3300 km swath

global coverage, 2x/day/satellite
Concerned with possible data gap (MODIS)

AWiFS (ISRO)

spatial resolution: 25 m
600 km swath



Concerned with possible data gap

Sentinel 2 (ESA)

13 spectral bands (VIS, NIR & SWIR)
Spatial resolution: 10, 20 and 60 m
290 km swath



Free?
Concern: Policy for US users is not defined

Landsat (USGS/NASA)

spatial resolution: 15m, 30m

183 km swath

Free
global coverage, seasonal
Concerned with possible data gap
16 day repeat cycle

LISS-3: (ISRO)

spatial resolution: 23.5 m
141 km swath

Commercial Systems

spatial resolution ~ 1m

10 - 20 km swath

global coverage, very infrequent



= Monitoring

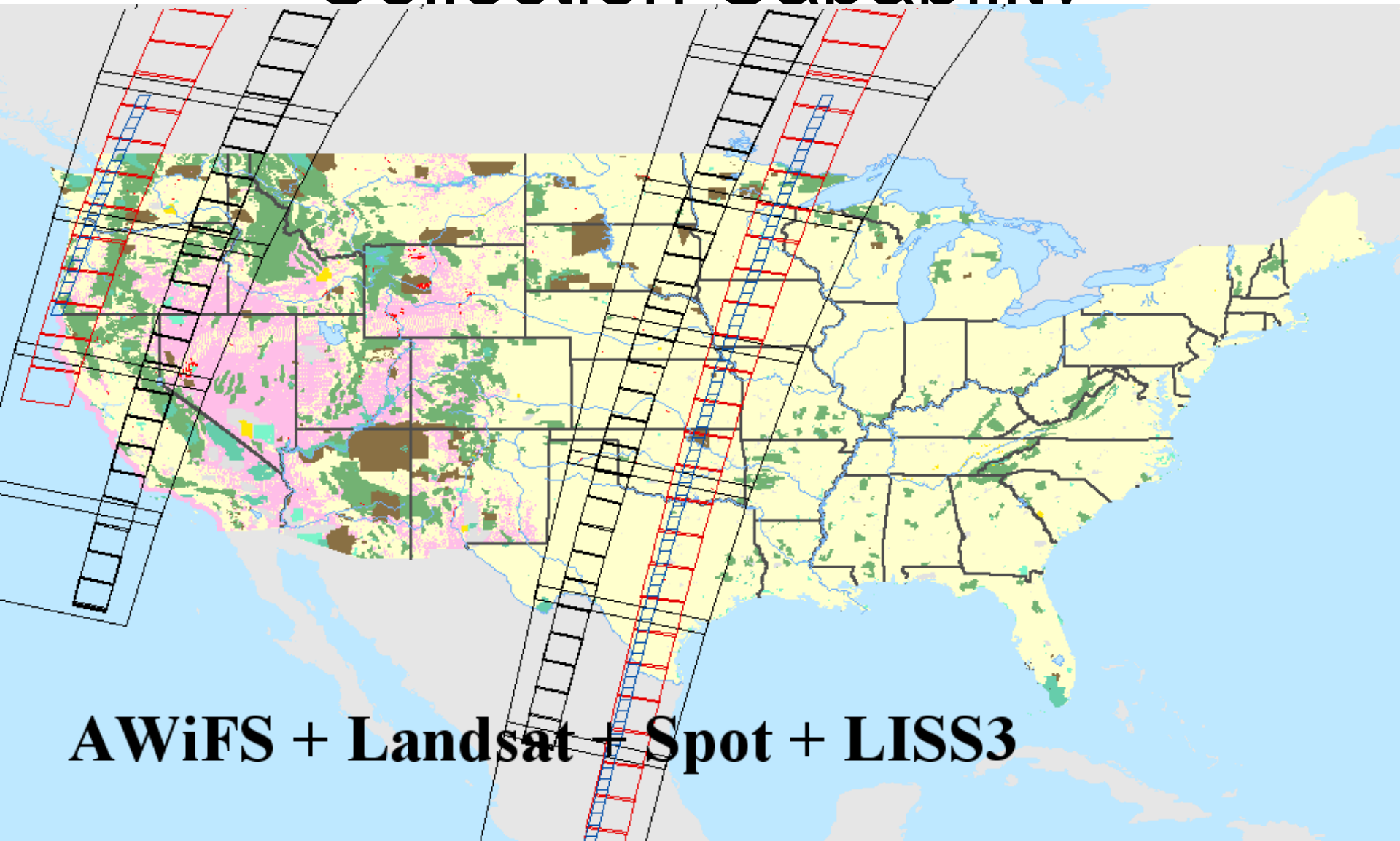


= Mapping



= Fire Monitoring

Comparing Single Pass Collection Capability



AWiFS + Landsat + Spot + LISS3

USDA Satellite Imagery Archive

Update on Activities

December 8, 2010

1. Update on FY2011 US CONUS Coverage of AWiFS
2. Prime Vendor Contract Has Ended
3. Curt Reynolds is now the USDA Satellite Archive manager
4. Cost Share of North America SPOT acquisitions

Update for FY2011 US CONUS Coverage

- RMA is not funding pasture rangeland forage (PRF) insurance expansion.
 - No third year of "leaf off" collection
- US AWiFS collection will start Sept. 30, 2010 using CCC funds.
- RMA not funding continuation of i-cubed Web Hosting

USDA Satellite Imagery Archive: Web Hosting



The image is a screenshot of the USDA Satellite Imagery Archive website. A large, semi-transparent red prohibition sign (a circle with a diagonal line) is centered over the map area, indicating that the service is not available or is being discontinued. The website layout includes a header with the RMA logo, contact information for Dr. Shawana P. Johnson, and the site title "USDA Satellite Imagery Access Site". The main content area is divided into several sections: a "Welcome, Guest!" section with login fields; a "Select Product" section with instructions; a "Locate" section with a map and navigation tools; a "My Order" section showing "No products selected..."; and a "Check Out" section with a "Proceed" button. The map shows a world map with various countries labeled. The footer includes copyright information for 2010 i-cubed and 2010 USDA - SIA.

RMA

Satellite Product Questions/Member List
Dr. Shawana P. Johnson
shawana@globalinsights.com
216.525.0600

USDA Satellite Imagery Access Site
Acquisition & Analysis

James D. Hipple, PhD
james.hipple@rma.usda.gov
317.287.3313

Welcome, Guest !

User Name:

Password:

Select Product

1. "Locate" or use the "Map Navigation Tools" to navigate to the vicinity of your project

2. Use the "AOI Tools" to define your AOI

Product Details

(0) Items in Order

Locate

Area of Interest

Scale: 1:200,940,828
Latitude: 100.95
Longitude: -156.01
Zone: 4
Area: No AOI

My Order

No products selected...

Check Out

© 2010 i-cubed , © 2010 USDA - SIA

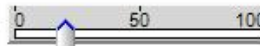
<http://usda-sia.datadoors.net/datadoorsweb/>







[Query](#) [Results](#)

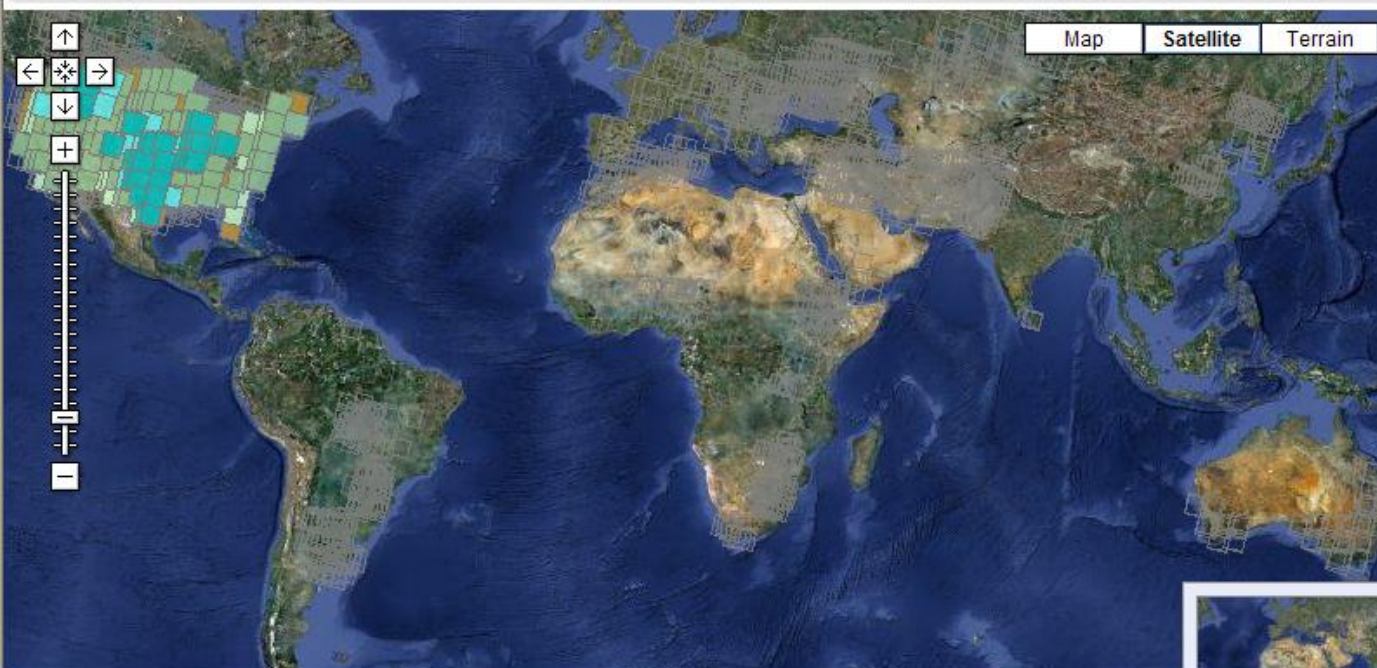
SATELLITE	PATH & ROW	ACQUISITION DATE
AWIFS (J) <input type="button" value="v"/>	PATH: TO: ANY: <input type="radio"/> ALL <input type="radio"/> YEAR CYCLE > <input checked="" type="radio"/> 2010 <input type="radio"/> 2009 <input type="radio"/> 2008	
Select a Region <input type="button" value="v"/>	<input type="text"/> <input type="text"/> <input type="text"/>	SEASON: December <input type="button" value="v"/> TO: December <input type="button" value="v"/>
Select a Country <input type="button" value="v"/>	ROW: TO: ANY: <input type="text"/> <input type="text"/> <input type="text"/>	YEARS: 1984 <input type="button" value="v"/> TO: 1984 <input type="button" value="v"/>
	SINGLE DATE RANGE > <input type="radio"/>	FROM: 12/07/10 TO: 12/07/10
<input type="button" value="Perform Query"/>		

Make selections by clicking on scene footprints below.

Transparency (%):







**Legend** (symbolized by age of most recent imagery acquisitions per scene):

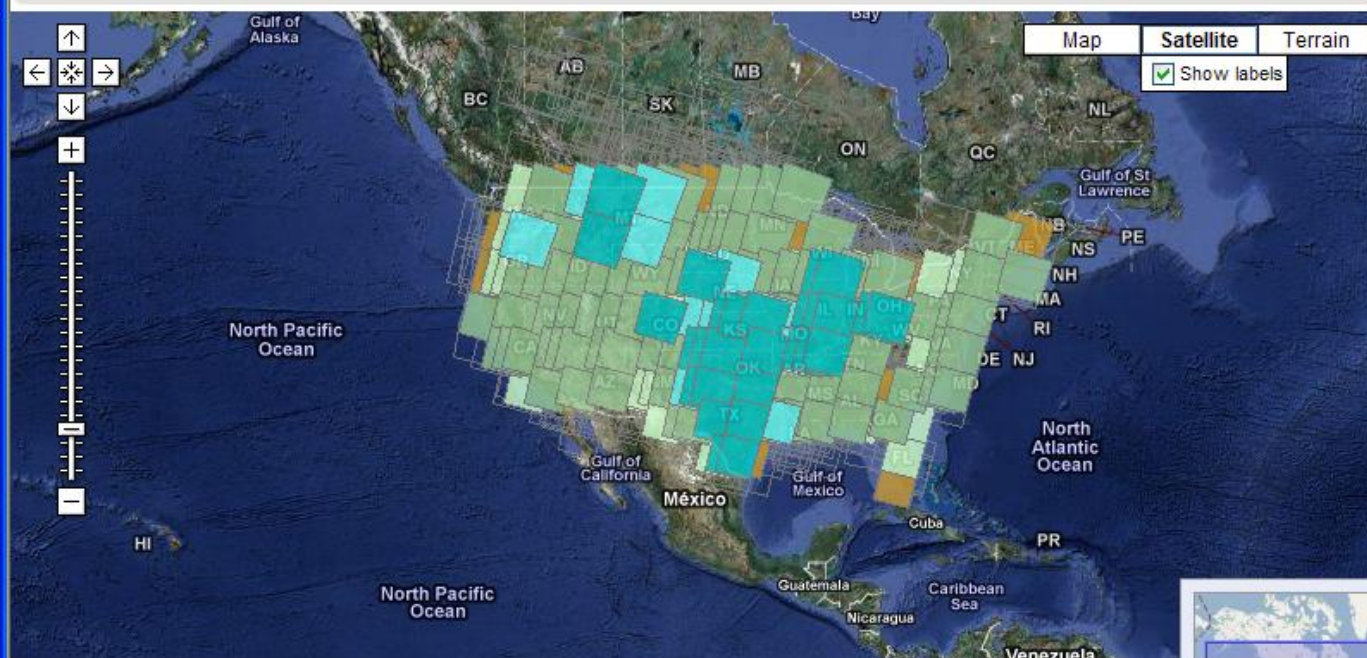
- | | | |
|---|--|---|
|  1 to 30 days |  61 to 90 days |  121 to 150 days |
|  31 to 60 days |  91 to 120 days |  > 150 days |



Clear Selection

A horizontal number line with tick marks at 0, 50, and 100. A blue arrow points to the number 25.

 1 to 30 days
  61 to 90 days
  121 to 150 days
 31 to 60 days
 91 to 120 days
 > 150 days



2010 Value of AWiFS From USDA Satellite Archive (SIA).

- APHIS- \$8,474
- ARS- \$270,276
- FS- \$116,495
- NASS- \$291,506
- NRCS- \$87,059
- RMA- \$378,208

Image Downloads * price/scene

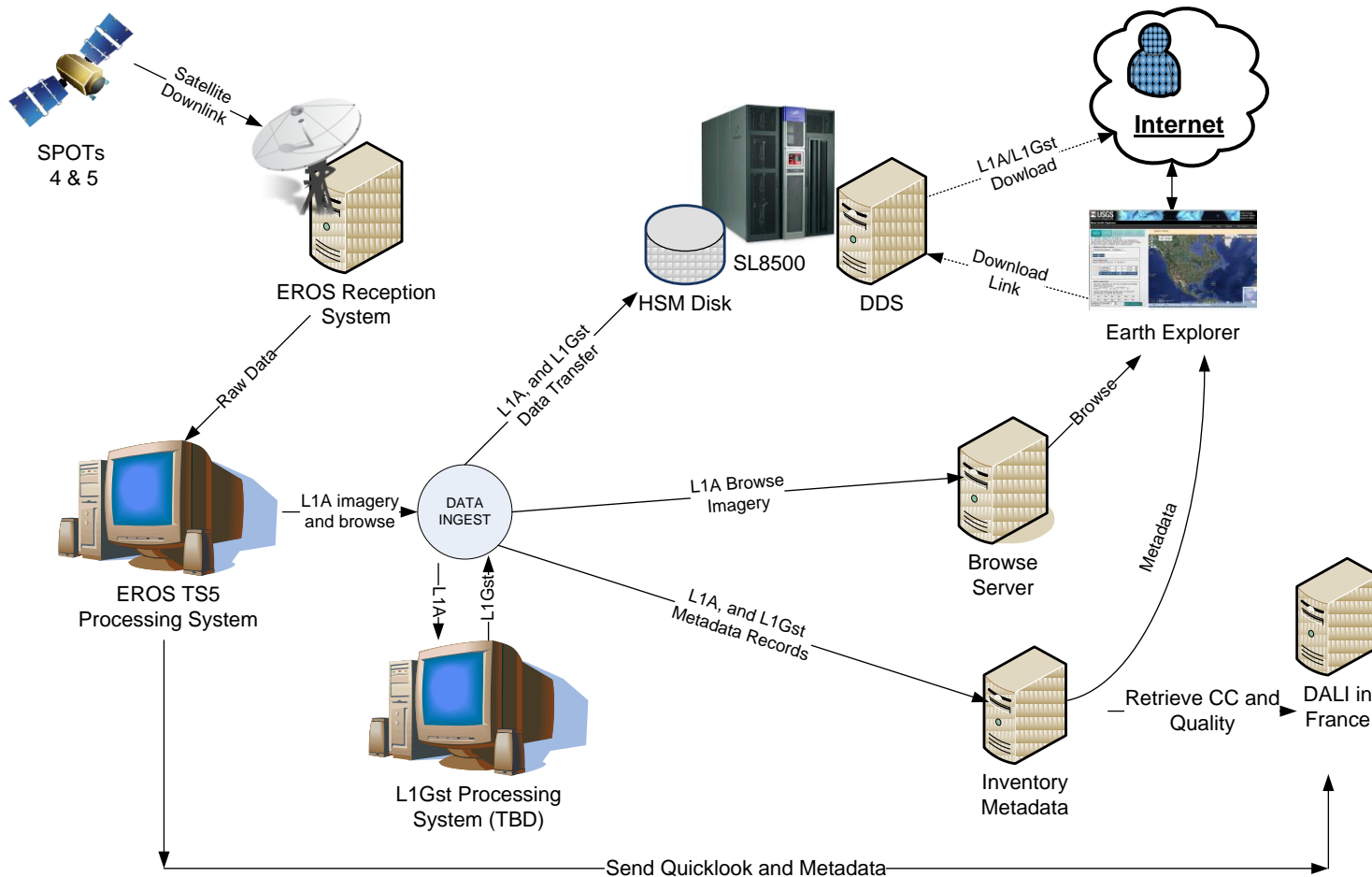
SPOT Data Buy

Glenn Bethel

USDA Remote Sensing Advisor



Current Operations



EarthExplorer Interface

**Government users may search data at
<http://earthexplorer.usgs.gov>.**

**Data are available to US Federal civil,
state, and local government users.**

Imagery is distributed in:

SPOT L1A Dimap.

L1Gst Geotiff format.

(L2A comparable product).

To See Spot Imagery, you must login


EarthExplorer


HomeLoginRegisterShopping BasketHelp



















There are 2 messages. (Updated: 1/12/2010)

The U.S. Geological Survey is dedicated to providing extensive data to the global science community. However, certain data sets require additional procedures to gain access to them. For example, some commercial satellite scenes of U.S. sites are licensed only for U.S. users. Please log in to find what additional data sets may be available.

1. Select your dataset(s)

Click on  next to the category name to show a list of datasets.

 Icon means selected data within the Data Sets can be downloaded at no charge.

-  Aerial Photography
-  AVHRR
-  Cal/Val Reference Sites
-  Commercial
-  Declassified Data
-  Digital Elevation [\(Related Links\)](#)
-  Digital Line Graphs [\(Related Links\)](#)
-  Digital Maps [\(Related Links\)](#)
-  EO-1
-  Forest Carbon Sites
-  Global Land Survey
-  HCMM
-  Land Cover
-  Landsat Archive [\(Related Links\)](#)
-  Landsat Legacy
-  Landsat MRLC
-  NASA LPDAAC Collections
-  Radar

2. Enter your search criteria


Address/Place Name/ Zip Code **Search** **Reset**

Search: [\(US/World Feature Search\)](#)


From (mm/dd/yyyy): To (mm/dd/yyyy):


☐ Search these months only.

3. Search >>>




1. Select your dataset(s)

Click on  next to the category name to show a list of datasets.

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- ☐ Aerial Photography
- ☐ AVHRR
- ☐ Cal/Val Reference Sites
- ☐ Commercial
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- ☐ Digital Elevation ([Related Links](#))
- ☐ Digital Line Graphs ([Related Links](#))
- ☐ Digital Maps ([Related Links](#))
- ☐ EO-1
- ☐ Forest Carbon Sites
- ☐ Global Land Survey
- ☐ HCMM
- ☐ Land Cover
- ☐ Landsat Archive ([Related Links](#))
- ☐ Landsat Legacy
- ☐ Landsat MRLC
- ☐ NASA LPDAAC Collections
- ☐ Radar
- ☒ SPOT - Historical
- ☒ SPOT - North American Data Buy

Selected Datasets



 None Selected

Display Tooltips ☒

2. Enter your search criteria

Address/Place Name/ Zip Code

Search: ([US/World Feature Search](#))

From (mm/dd/yyyy):  To (mm/dd/yyyy): 

☐ Search these months only.

3. Search >>>

↑

←

→

↓

+

-

Lat/Long Grid

Dec


DMS

Map

Satellite

Terrain

☒ Show Labels



Help Hide Map Clear My Area Selection Add Map to Selection

The up to date Google map is not for purchase or for download; it is to be used as a guide for reference and search purposes only.

Area Selected

Degree/Minute/Second ☒ Decimal ☐

1. Latitude: ° ' " North Longitude: ° ' " West

- You can also download free Landsat 4/5 using Earth Explorer

SPOT 4 & 5 Data Acquired 12/16/09 – 10/27/10

Spot 4

Pan

2,630 scenes

MSI

28,848 scenes

Spot 5

Pan

6,859 scenes

MSI

15,969 scenes

Total

54,306 scenes



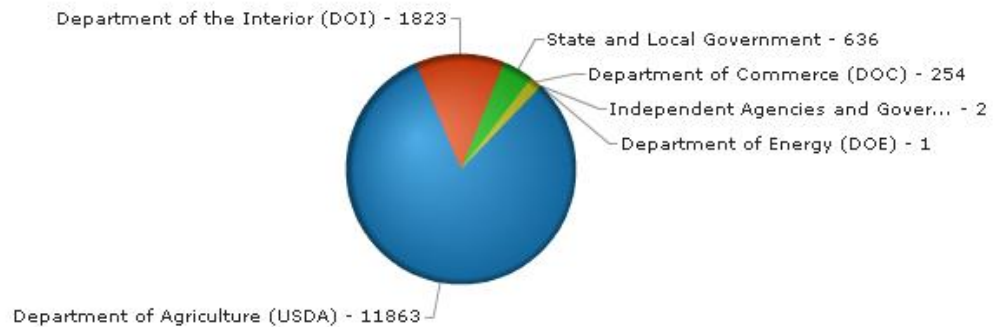
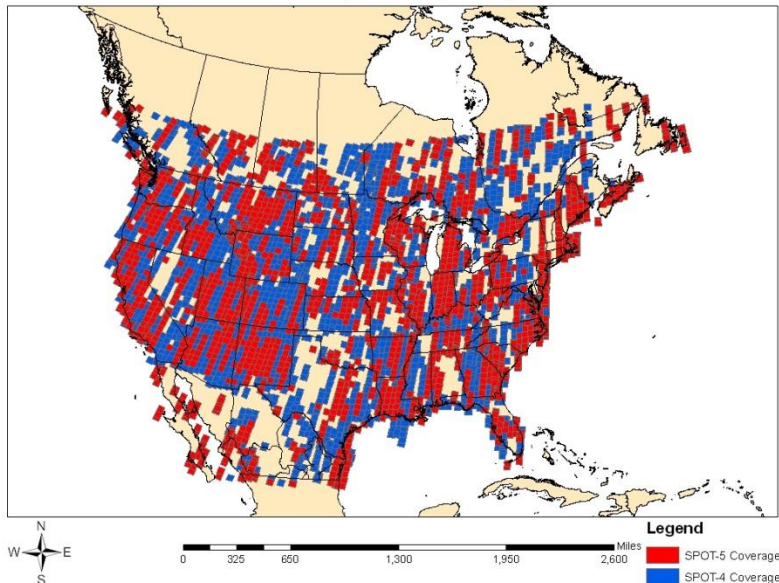
FedCiv, State, Local Government
L1A and L1Gst
Contract through 12/15/2010

USDA, USGS, NASA Partnered

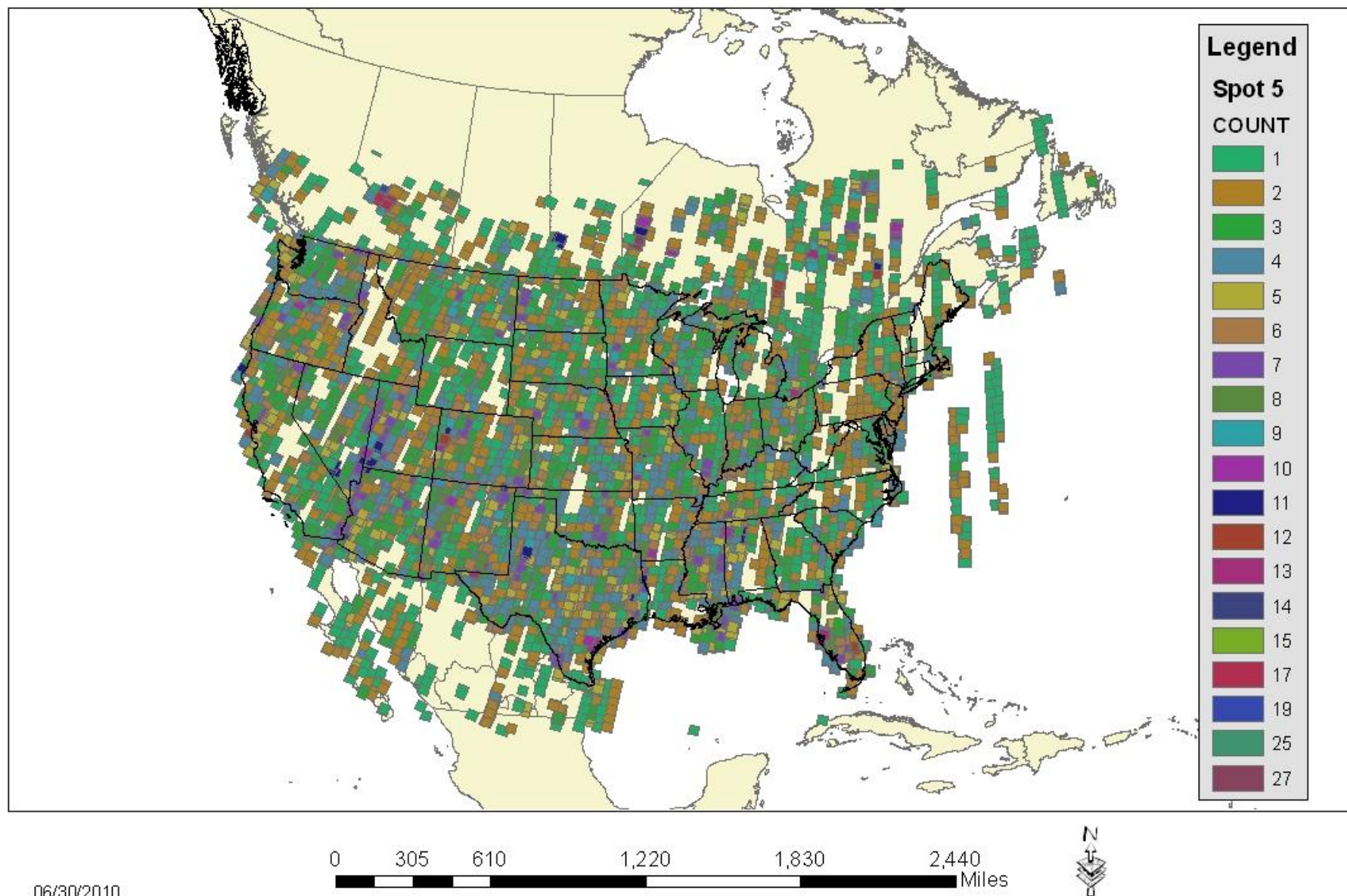
North American Data Buy Value

- > 54K SPOT scenes acquired
- For FedCiv, State, Local license \$3500/scene (average)
- To date, received over \$189M worth of imagery (even if only 1/10 proves useful, that is still \$20M worth)
- Average price per scene acquired is roughly \$19

USGS SPOT Databuy Coverage - September 2010



USGS SPOT-5 Databuy Coverage by Count



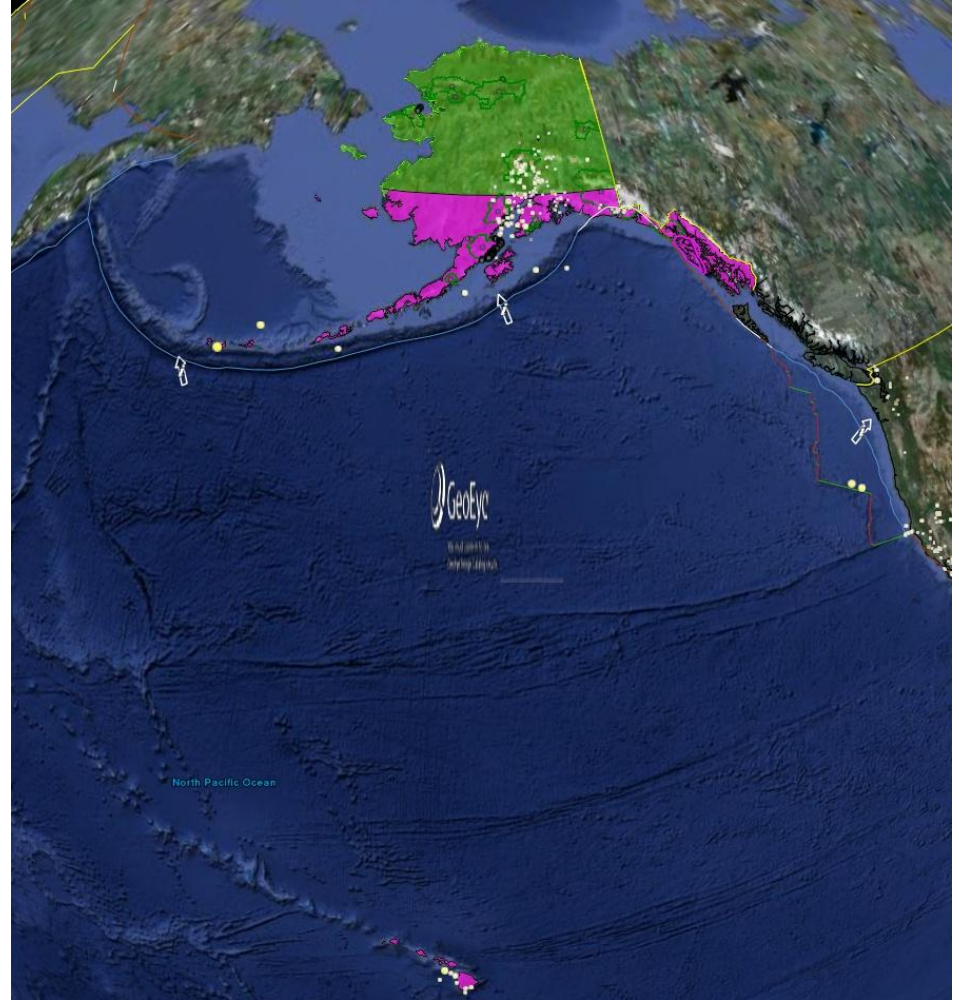
2011 Spot Data Buy

- USGS and USDA may partner again to acquire moderate resolution multi-spectral data over the conterminous US and portions of Canada and Mexico for the time period December 16, 2010 - December 15, 2011.
- NASA will not be cost sharing this year.

2011 Commercial Data Buy Alaska and Hawaii Option

Frequency

- monthly except for region north of 61.5N (in green) where no imagery is required outside a March 15 – October 15 window and Alaska south of 61.5N where one time coverage is required between December 16, 2010 and March 14, 2011



2011 Spot Data Buy

- There is an option for AK/HI coverage as specified in a previous e-mail to most of the group (essentially moderate resolution coverage of the states for the time period December 16, 2010 - December 15, 2011 with the exception of the region north of 61.5 degrees which would essentially only require coverage for the period March 15 - Oct 15, 2011.
- Based on our current estimates, we do not believe that USDA and USGS funds alone will be able to cover this option, but there is an opportunity for others to contribute to allow for this to happen (the licensing for all of this would be FedCiv plus State, Local and Tribal Governments). Again, specific details cannot be provided, but the funds needed would be less than \$500,000.

2011 Commercial Data Buy South America Option

Region

- Peru south of 15S
- Chile
- Argentina
- Uruguay
- Brazil south of 5S

Frequency

- quarterly except for agricultural regions of concern east of 67W where monthly coverage during the growing season is requested



Summary

- Data buys are one of the actions from the Landsat Data Gap Study Team that NASA and USGS co-lead.
- Current data buy, ends in mid-December, extremely successful.
- Working to award new contract by mid-December, no interruption of service.
- Options added for Alaska, Hawaii and South America.
- Goal is to receive global coverage.
- Looking to continue the USDA, NASA and USGS partnership.



Toolbox Weather Soil Moisture Vegetation Index Satellite Data Growing Season

World — MODIS Image Gallery System Status

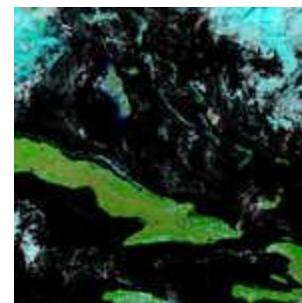
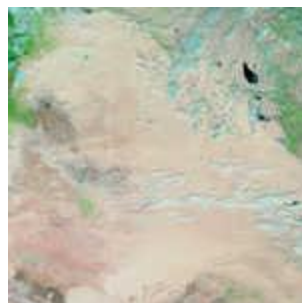
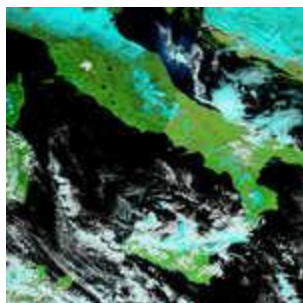
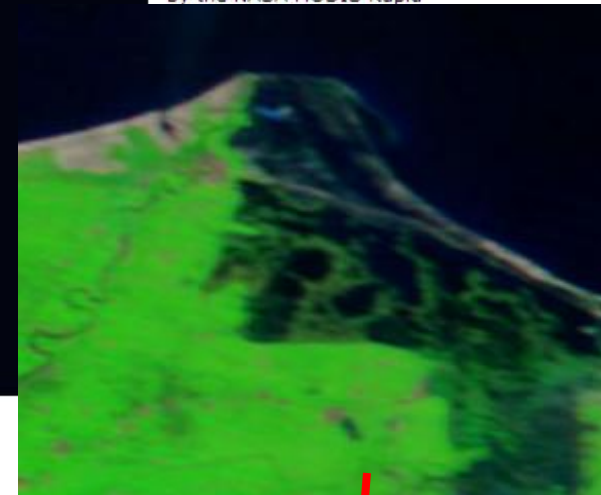
Click on a region to see MODIS images



Click on a region to view MODIS images

Agricultural Production Regions and MODIS

Mosaic images were created by the NASA MODIS Rapid



MODIS Imagery Continues to be made available

Crop Explorer - United States

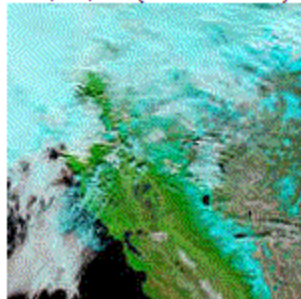
Select Satellite ▼

Satellite: terra.721 Region: r14c06 Year: 2010

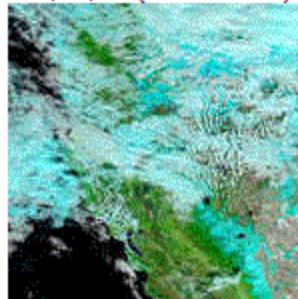
12/08/10 (342 of 2010)

Image
Not
Available

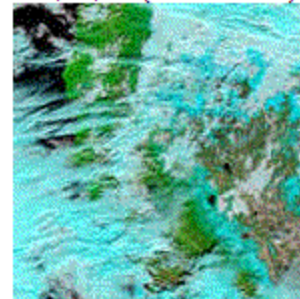
12/07/10 (341 of 2010)



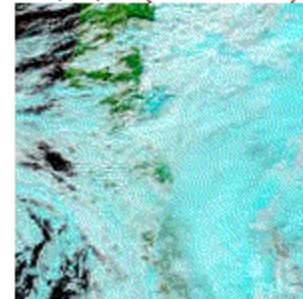
12/06/10 (340 of 2010)



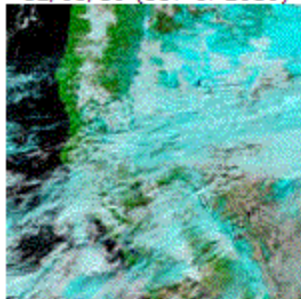
12/05/10 (339 of 2010)



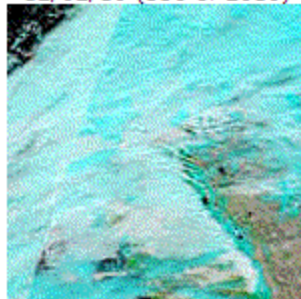
12/04/10 (338 of 2010)



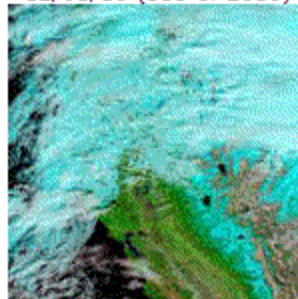
12/03/10 (337 of 2010)



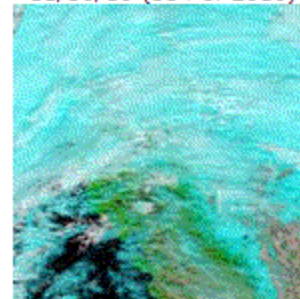
12/02/10 (336 of 2010)



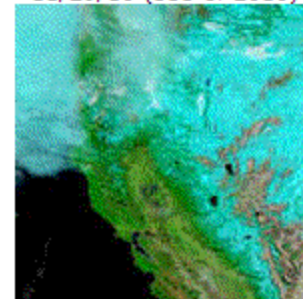
12/01/10 (335 of 2010)



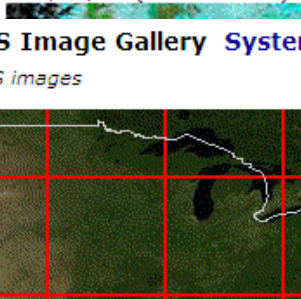
11/30/10 (334 of 2010)



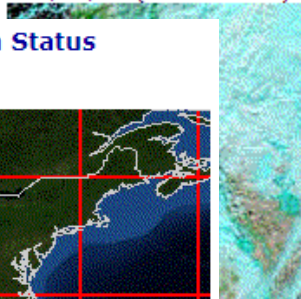
11/29/10 (333 of 2010)



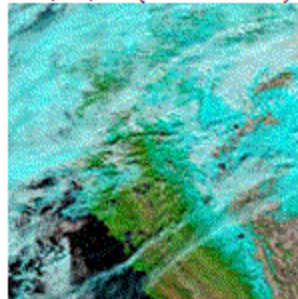
11/28/10 (332 of 2010)



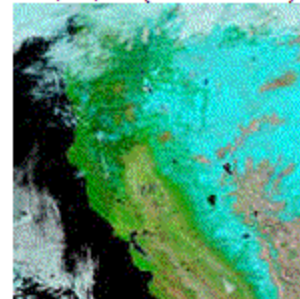
11/27/10 (331 of 2010)



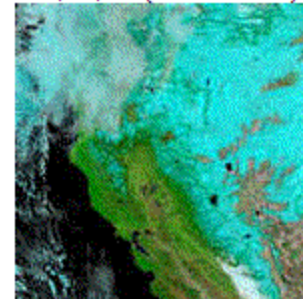
11/26/10 (330 of 2010)



11/25/10 (329 of 2010)

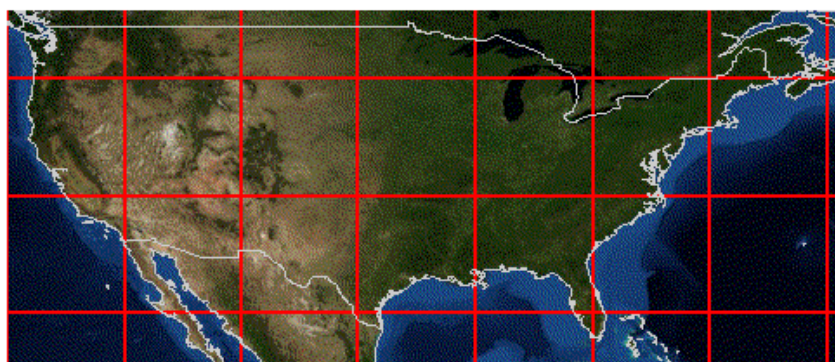


11/24/10 (328 of 2010)

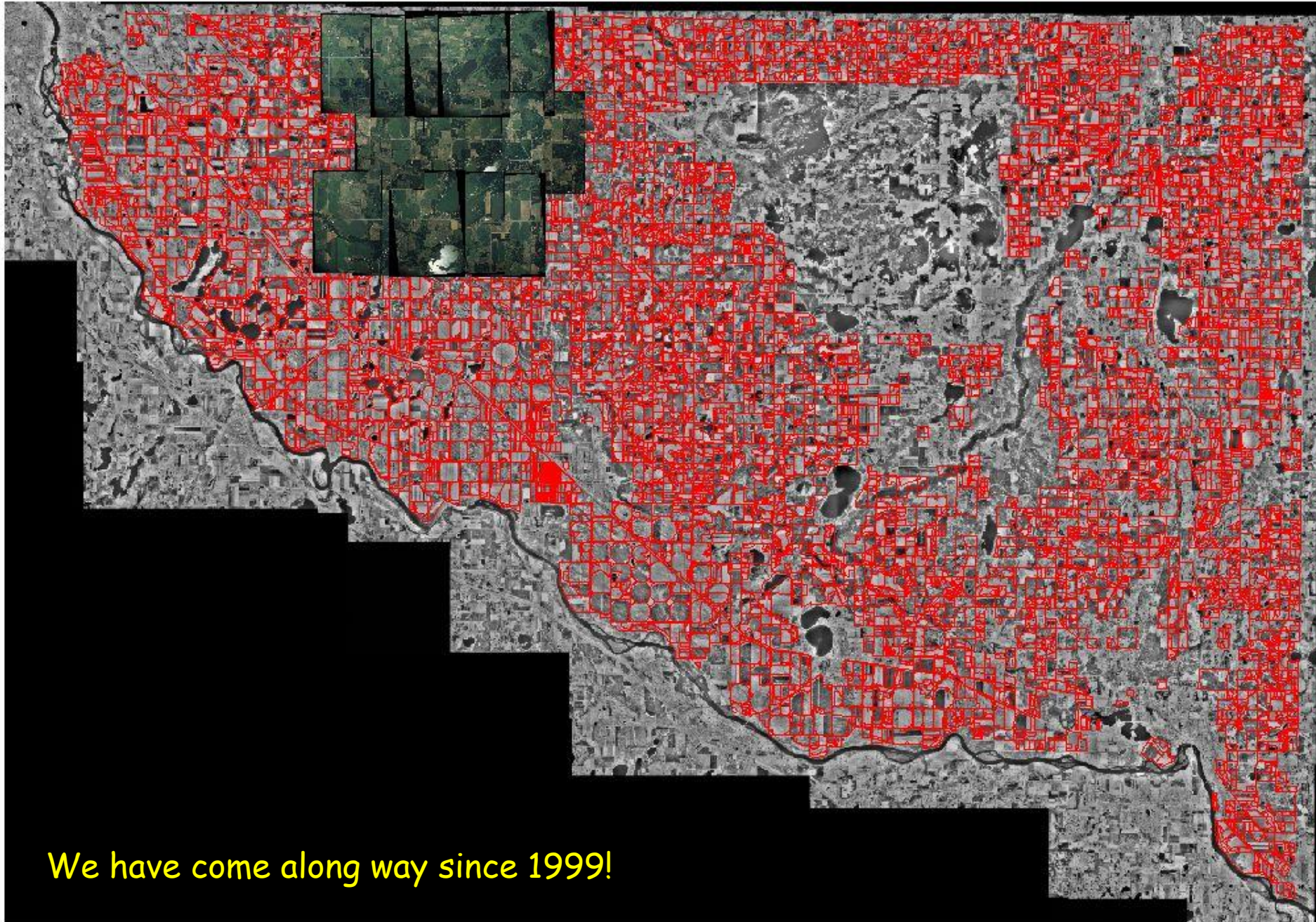


United States — MODIS Image Gallery [System Status](#)

Click on a region to see MODIS images



DOQ With CLU and Rectified 35mm Slides



We have come along way since 1999!